

Site Team Evaluation Prioritization

0310450012- Cook Co.
Alco Springs Industries
ILD 048300412
SF/HRS

CERCLA Report

EPA Region 5 Records Ctr.



283352



**Illinois Environmental
Protection Agency**

2200 Churchill Road
P. O. Box 19276
Springfield, IL 62794-9276

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1. SITE BACKGROUND

1.1 INTRODUCTION

On September 30, 1995 the Illinois Environmental Protection Agency's CERCLA Site Assessment Program was tasked by the U.S. Environmental Protection Agency (USEPA) to conduct a Site Team Evaluation Prioritization (STEP) of the Alco Springs site.

This investigation was undertaken by the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 40 CFR, 1980 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986.

Alco Springs was initially placed on the Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) in response to the State of Illinois concerns that past site activities may have caused groundwater contamination and/or sediment contamination of the nearby wetlands and Thorn Creek.

In November of 1995 the Illinois EPA's CERCLA Site Assessment Unit prepared a Site Team Evaluation Prioritization Work Plan for Alco Springs, which was submitted to the Region V Offices of USEPA for review. A site safety plan was also prepared at this time, and after being reviewed by the Illinois EPA's Office of Chemical Safety, the field activity portion of the inspection occurred on

December 5, 1995. The CERCLA Inspection included the collection of 8 sediment samples.

1.2 SITE DESCRIPTION

The Site is located at 23rd Street and Euclid Avenue on a 20 acre parcel of land in Chicago Heights, Cook County, Illinois. Alco Springs is a manufacturer of steel springs for heavy machinery. The site is active and consists of facility buildings on the eastern side of the property, a landfill in the middle, a surface impoundment west of this, and a low marshy area on the northwestern side of the property. The landfill is approximately 300 feet by 150 feet. Surface water runoff from the site is directed toward the south, collects in a drainage ditch and flows into Thorn Creek, which is approximately 50 feet west of the site. The surface impoundment is a concrete structure with an approximately volume of 4500 cubic feet. This impoundment was used to separate oil from the process water used in the "quench bath" segment of the operation. From here the process water was directed into a drainage way and then into Thorn Creek. This system is no longer in use.

The site is located in a suburban area. Surrounding land use within 0.25 mile of the site includes residential areas to the northwest and east, and recreational areas to the southwest, north, and west within the Sauk Trail Forest Preserve and Cook County Forest Preserve. (See Figure 1, Site Location Map and Figure 2, Site Topographic Map.)

1.3 SITE HISTORY

Operations at the site began in 1913 on 42 acres of land with Alco Springs being a division of American Locomotive. In 1972, 20 acres were sold to Sun Steel Company, an adjacent facility, and Alco Springs Industries became part of Studebaker Corporation, the parent company.

The steel spring manufacturing process involves forming heated spring steel into the desired shape and then submerging it in a quench oil bath. Before the use of a quench oil reclaiming system in 1980, oil from the "quench bath" was cooled and directed to a retention basin behind the facility. Oil was skimmed from the surface of this basin and the remaining water was discharged into Thorn Creek. The retention basin is no longer in use.

In 1980, IEPA responded to a complaint that Alco Springs was discharging process water into Thorn Creek. The inspection found 100-120 drums that contained oil and scale stored south of the landfill. IEPA received another complaint in 1981, against Alco Springs this time alleging the illegal dumping of wastes near Thorn Creek. During this visit IEPA representatives noted that the drums found earlier were now empty. Ultimately the site was referred to CERCLA and placed on CERCLIS in 1986. In 1987, a Field Investigation Team (FIT) Contractor conducted a Site Screening Inspection (SSI) and recommended the site be given a higher priority. A higher priority was again recommended as a result of a

1994, Site Inspection Prioritization, SIP, conducted at the site.

1.4 REGULATORY STATUS

Regulatory involvement at this site is limited to the above mentioned inspections by the Illinois EPA and USEPA. The original operations at the facility were never regulated under the Resource Conservation Recovery Act, (RCRA) and was not part of any regular inspections by either the Illinois EPA or USEPA. In 1989 Alco Springs was listed as a generator of hazardous waste under RCRA. Given the years of operation and the federal and state environmental regulations which existed during this time, the site does not fall under the jurisdiction of the Atomic Energy Act (AEA), Toxic Substances Control Act (TSCA), Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), or the Uranium Mill Tailings Radiation Control Act (UMTRCA).

2 STEP ACTIVITIES

This section contains information gathered during the preparation of the formal CERCLA inspection and previous IEPA activities involving this site. These activities included the reviewing of Illinois EPA records and preparation of the work plan and an interview with the current plant manager and a consultant for Alco Springs.

2.1 RECONNAISSANCE ACTIVITIES

In November of 1995 a reconnaissance visit of Alco Springs was made

by Mr. Mark Wagner of the Illinois EPA. The purpose of the visit was to observe the current site conditions and tentatively identify sample locations.

Access to the landfill and retention basin area was not restricted. Sauk Trail Forest Preserve borders these areas, and access is gained by simply crossing over Thorn Creek. This portion of the forest preserve is also bordered by a residential area to the west and connects with a Cook County forest preserve to the north.

The landfill, as described in earlier reports, lacks an approved cover and has exposed materials throughout its surface. This material consists mostly of scrap metal, concrete debris and some empty drums. One eroded area also has exposed oil and grease stained soils. From the base of the landfill a concrete pipe extends out and terminates in the retention basin area. Prior to 1980 this was a system used to "skim" oil from the process water before it was discharged into Thorn Creek. This area is located behind a small berm possibly to protect it from flooding conditions of Thorn Creek. (See Figure 3, site features map). The adequacy of it is questionable due to a marshy area north of the retention basin. Thorn Creek is parallel to west side of the site and continues to flow north under a railroad bridge and into Chicago Heights. Along this route are several wetlands and numerous points of access for the surrounding community.

2.2 INTERVIEWS

On December 5, 1996 prior to the collection of any samples the author met with the plant manager and a consultant for the company. At this time the author explained the general program objectives of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Further emphasis was placed on the need to evaluate the impact of the site on Thorn Creek. At this time neither the plant manager nor the consultant had any comments or questions regarding these activities.

SAMPLING ACTIVITIES

The CERCLA field sampling activities took place on December 5, 1995. The sediment samples were collected using stainless steel trowels and augers. All sampling was performed in accordance with IEPA sampling methods and procedures. Six sediment samples were collected from Thorn Creek to determine the level and extent of the contamination in it. Figure 4 outlines the sample locations from the December 1995, STEP. Sample descriptions are summarized in Table 1.

SAMPLING RESULTS

Several semivolatile organic and inorganic substances were detected at numerous sediment sample locations along Thorn Creek during the SIP and STEP inspections. On-site sample points reported significantly elevated organic and inorganic levels compared to

background levels. Off-site sediment samples also showed these contaminants to be elevated with respect to background levels and to the Ontario Sediment Standards. Key samples from the STEP inspection are presented in Table 2, and from the SIP inspection in appendix E.

The complete analytical data package for Alco Springs is located in Appendix F, and contains a copy of the Target Compound List (TCL) and data qualifiers used by USEPA.

3 SITE SOURCES

3.1 SOURCE DEFINITION

Two sources were identified at Alco Springs, they are a landfill and a surface impoundment.

This was an unpermitted landfill that accepted wastes from the early operation of the facility and until it was capped in 1981. These wastes include concrete, empty drums, pallets, scrap steel, steel grindings, and general refuse. Currently the cap applied in 1981, has eroded in places and wastes disposed of in it are exposed. Ecology and Environment has calculated the volume of the landfill at 41,667 cubic yards with a surface area of 45,000 square feet.

The March 1995, Site Inspection Prioritization (SIP) found the exposed face of the landfill to contain 13 semivolatile compounds

and seven inorganic analytes all significantly above background levels. Several of these same contaminants were detected downstream of the site in Thorn Creek.

The surface impoundment is a concrete structure with an approximately volume of 4500 cubic feet. As mentioned earlier this impoundment was used to separate oil from the process water used in the "quench bath" segment of the operation. From here the process water was directed into a drainage way and then into Thorn Creek.

4 MIGRATION PATHWAYS

4.1 SURFACE WATER PATHWAY

The surface water pathway starts where surface water run-off from the site enters the first perennial water body. This location is referred to as the probable point of entry (PPE). The PPE for Alco Springs is located where the site drainage ditch enters Thorn Creek. This pathway follows Thorn Creek for 11 miles north to the confluence of Thorn Creek and the Little Calumet River where it continues for an additional 4 miles. Along this route are approximately 17 miles of wetlands classified as palustrine, forested, broad-leaved deciduous, temporarily flooded wetlands. This completes the 15-mile target distance limit for Alco Springs.

Six samples taken at the PPE and down stream of it reported results that exceed the Ontario Sediment Standards for the lowest effect levels for arsenic and copper. These samples cover a ½ mile of wetland areas located along Thorn Creek. Previous sampling has also detected inorganic contaminants with arsenic, lead and zinc exceeding the lowest effect levels and copper exceeding the sever effect level for the Ontario Sediment Standards.

4.2 SOIL EXPOSURE PATHWAY

Three soil samples were collected during the March 1995 SIP, one background and two on-site samples. Soil sampling was not part of the more recent STEP inspection.

The on-site samples collected during the previous CERCLA investigation revealed 13 semivolatile compounds and seven inorganic analytes all of which exceeded background levels. One sample location was in an area of the landfill that had exposed refuse. This area reported elevated levels for several inorganic analytes. (see appendix E&F) Access to this area is gained by simply crossing Thorn Creek. This immediate area has no recreational use and is not within 200 feet of a residence. Approximately 17,532 people reside within 1 mile of the site.

4.3 GROUNDWATER PATHWAY

The landfill is located on a narrow valley floor in the flood

plane of Thorn Creek. According the 1995 SIP, this area is underlain by three major water-bearing units. They are a glacial drift unit, a Silurian dolomite formation, and the Cambrian-Ordovician aquifer system. The glacial drift deposit ranges in thickness from 5 to 40 feet and is composed of generally well-sorted, well-bedded sands and gravels near the site. The Silurian dolomite is an approximately 500-foot thick formation consisting of two layers: the Niagarian series overlying the Alexandrian series. The glacial drift aquifer and the Silurian dolomite aquifer appear to be hydraulically connected and together form the aquifer of concern (AOC). The Ordovician system consists of alternating dolomite, shale, and sandstone layers underlying the Silurian system. The Ordovician system ranges from approximately 700 to 1,000 feet thick.

No groundwater samples were collected during this STEP, however groundwater samples were collected during the SIP. These samples document an observed release of cobalt, manganese and nickel to the AOC. (see appendix E) Approximately 50,000 people utilize the AOC as a source of drinking water.

4.4 AIR PATHWAY

The closest resident is 800 feet west of the site. There are no air related complaints on file with the IEPA or inspections due to air emission problems. Based on these reasons, no formal air sampling was performed during this STEP inspection.

TABLE 1

SAMPLE DESCRIPTIONS

ALCO SPRINGS

ILD 048300412/LPC 0310450012

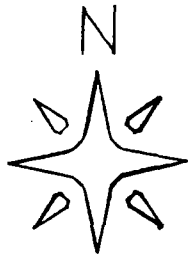
SAMPLE	DEPTH	APPEARANCE	LOCATION
X201	0-6"	Loose gray clay (some sand)	Sauk Trail Lake near 26th Street
X202	0-6"	Fine silty sediment (little or no sand)	At PPE of site drainage ditch to Thorn Creek
X203	0-6"	Tight gray clay (with sand)	177 feet downstream of X202
X204	0-6"	Silty sand	Large pooled area 277 feet downstream of X203
X205	0-6"		duplicate of X204
X206	0-6"	Dark silt (with sand)	270 feet downstream of X204/X205
X207	0-6"	tight gray clay	295 feet downstream of X206
X208	0-6"	Dark silty-sandy loam	Storm water runoff from northside of RR bridge 150 feet north of RR 125 feet west of bridge

SITE NAME: ALCO SPRINGS

TABLE 2
KEY SAMPLE SUMMARY

ILD 048300412
LPC 0310450012

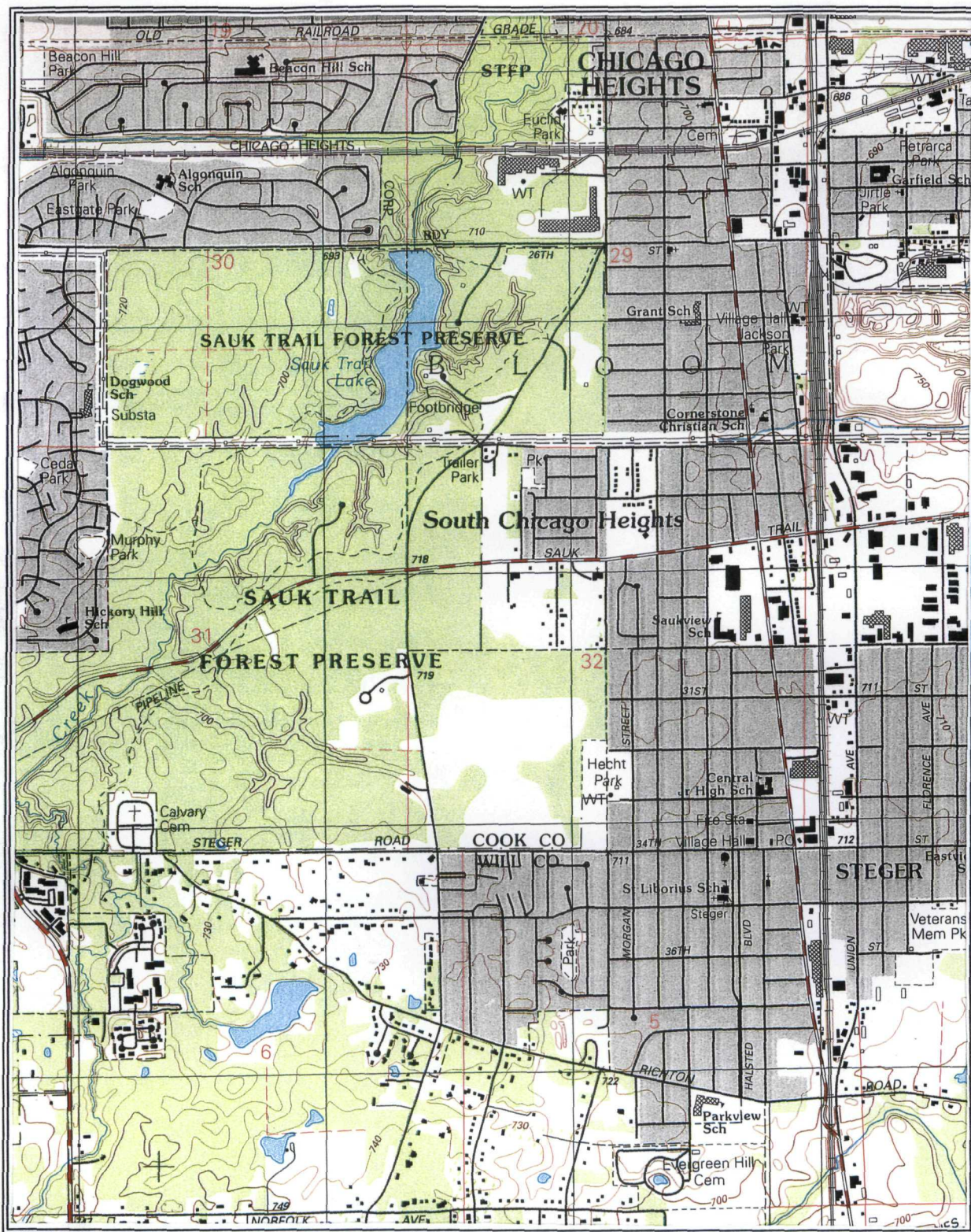
SAMPLING POINT	X201	X202	X203	X204	X205	X206	X207	X208
	EAPM1	EAPM2	EAPM3	EAQA4	EAQA5	EAQA6	EAPNO	EAPN1
PARAMETER								
SEMIVOLATILES ug/kg								
Fluoranthene	410U	480J	430U	78J	43J	89J	420U	650
Pyrene	410U	450J	430U	77J	44J	88J	420U	480
PESTICIDES ug/kg								
4,4'-DDE	4.1U	5.1U	4.3U	3.9U	26	4.6U	4.2U	-
4,4'-DDT	4.1U	5.1U	4.3U	3.9U	13	4.6U	4.2U	-
INORGANICS mg/kg	MEZP93	MEZP94	MEZP95	MEZP96	MEZP97	MEZP98	MEZN75	MEZN77
Arsenic	6.4	6.9	6.0	12.3	13.0	9.9	8.1	8.1
Chromium	18.2	14.7	17.3	9.0	9.5	9.2	18.9	14.5
Copper	19.6	21.4	22.8	22.9	21.5	13.0	27.3	42.1
Lead	18.2	14.7	12.8	14.0	16.1	9.0	9.4	46.7
Vanadium	19.8	16.6	18.1	11.1B	10.9B	11.6	18.8	13.6
Zinc	52.7	55.1	52.7	71.6	54.5	35.1	52.7	93.8
Cyanide	0.08U	0.09U	0.11B	0.11B	0.13B	0.08U	0.07U	0.11B



SITE LOCATION MAP

ALCO SPRINGS

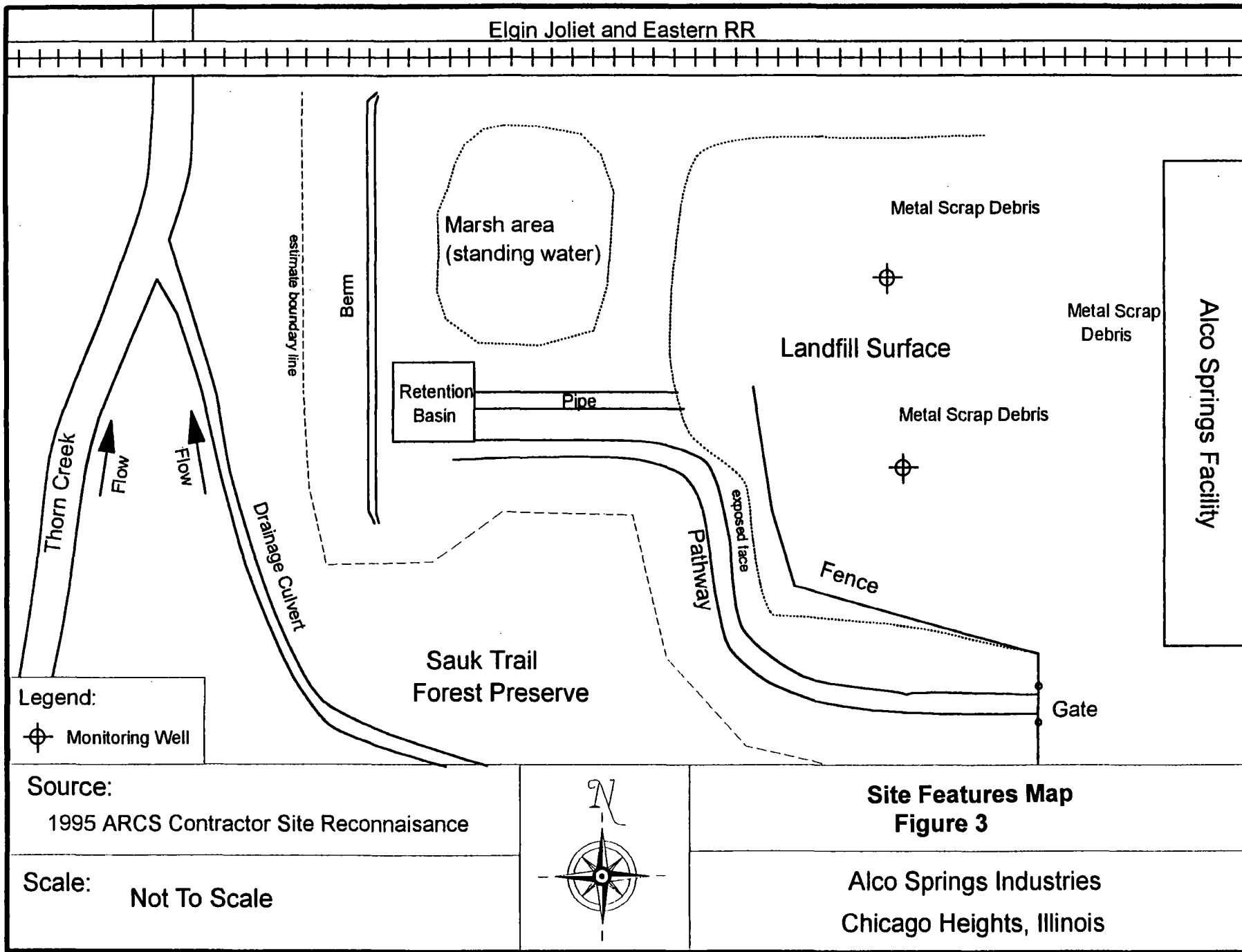
Figure 1.



Steger Quadrangle, 7.5 minute.

Topographic Map
ALCO SPRINGS ILD 048300412

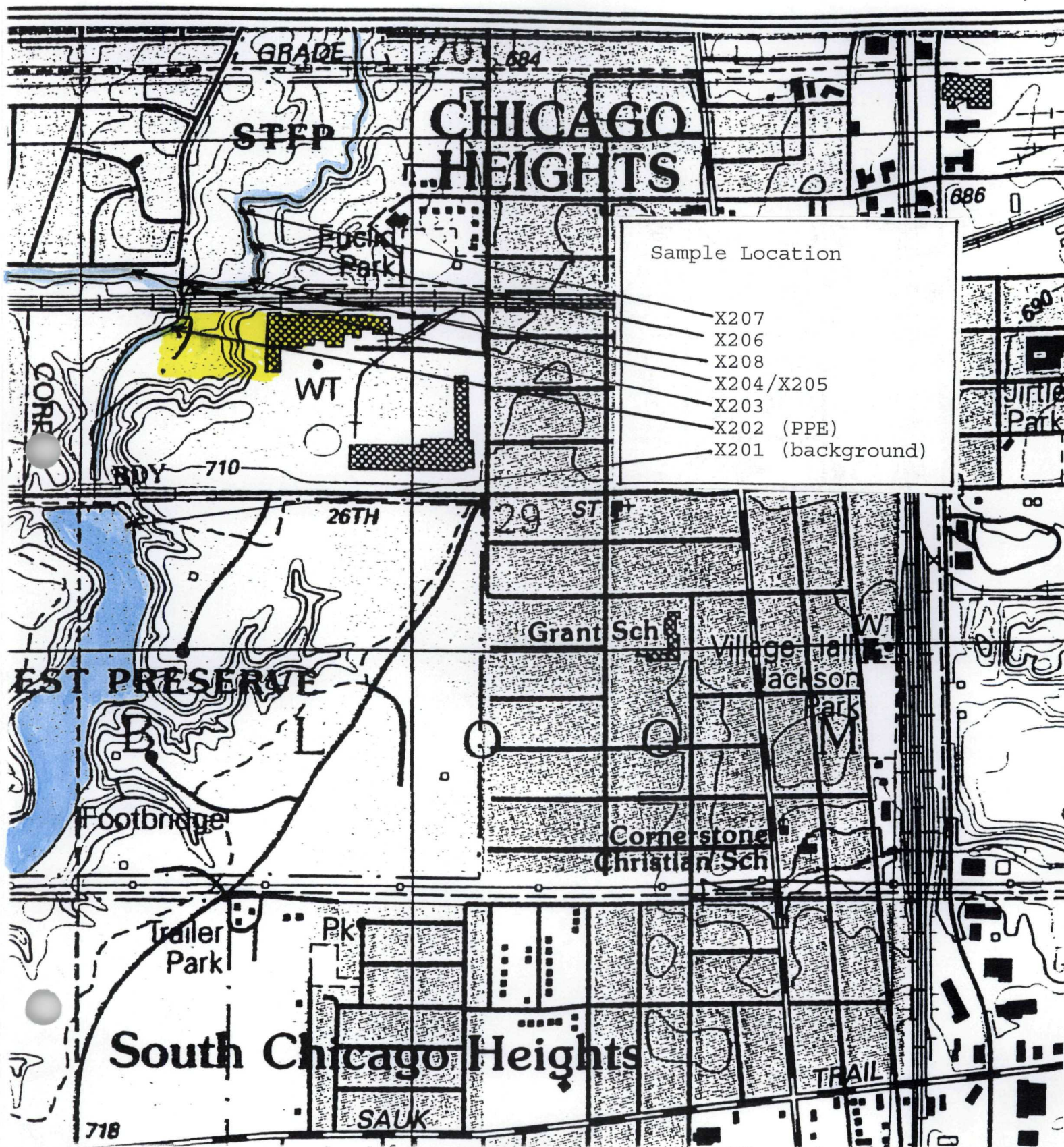
Figure 2.



SAMPLE LOCATION MAP

Alco Springs

Figure 4.



APPENDIX A

4 MILE RADIUS & 15 MILE SURFACE WATER MAP

SDMS US EPA Region V

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APPENDIX B
AREA WETLAND MAP



SITE WETLANDS MAP

ALCO SPRINGS

APPENDIX C
TARGET COMPOUND LIST & DATA QUALIFIERS

TARGET COMPOUND LIST

Volatile Target Compounds

Chloromethane	1,2-Dichloropropane
Bromomethane	cis-1,3-Dichloropropene
Vinyl Chloride	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride	1,1,2-Trichloroethane
Acetone	Benzene
Carbon Disulfide	trans-1,3-Dichloropropene
1,1-Dichloroethene	Bromoform
1,1-Dichloroethane	4-Methyl-2-pentanone
1,2-Dichloroethene (total)	2-Hexanone
Chloroform	Tetrachloroethene
1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
2-Butanone	Toluene
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride	Ethylbenzene
Vinyl Acetate	Styrene
Bromodichloromethane	Xylenes (total)

Base/Neutral Target Compounds

Hexachloroethane	2,4-Dinitrotoluene
bis(2-Chloroethyl)Ether	Diethylphthalate
Benzyl Alcohol	N-Nitrosodiphenylamine
bis(2-Chloroisopropyl)Ether	Hexachlorobenzene
N-Nitroso-Di-n-Propylamine	Phenanthrene
Nitrobenzene	4-Bromophenyl-phenylether
Hexachlorobutadiene	Anthracene
2-Methylnaphthalene	Di-n-Butylphthalate
1,2,4-Trichlorobenzene	Fluoranthene
Isophorone	Pyrene
Naphthalene	Butylbenzylphthalate
4-Chloroaniline	bis(2-Ethylhexyl)Phthalate
bis(2-chloroethoxy)Methane	Chrysene
Hexachlorocyclopentadiene	Benzo(a)Anthracene
2-Chloronaphthalene	3,3'-Dichlorobenzidene
2-Nitroaniline	Di-n-Octyl Phthalate
Acenaphthylene	Benzo(b)Fluoranthene
3-Nitroaniline	Benzo(k)Fluoranthene
Acenaphthene	Benzo(a)Pyrene
Dibenzofuran	Indeno(1,2,3-cd)Pyrene
Dimethyl Phthalate	Dibenz(a,h)Anthracene
2,6-Dinitrotoluene	Benzo(g,h,i)Perylene
Fluorene	1,2-Dichlorobenzene
4-Nitroaniline	1,3-Dichlorobenzene
4-Chlorophenyl-phenylether	1,4-Dichlorobenzene

Acid Target Compounds

Benzoic Acid	2,4,6-Trichlorophenol
Phenol	2,4,5-Trichlorophenol
2-Chlorophenol	4-Chloro-3-methylphenol
2-Nitrophenol	2,4-Dinitrophenol
2-Methylphenol	2-Methyl-4,6-dinitrophenol
2,4-Dimethylphenol	Pentachlorophenol
4-Methylphenol	4-Nitrophenol
2,4-Dichlorophenol	

Pesticide/PCB Target Compounds

alpha-BHC	Endrin Ketone
beta-BHC	Endosulfan Sulfate
delta-BHC	Methoxychlor
gamma-BHC (Lindane)	alpha-Chlorodane
Heptachlor	gamma-Chlorodane
Aldrin	Toxaphene
Heptachlor epoxide	Aroclor-1016
Endosulfan I	Aroclor-1221
4,4'-DDE	Aroclor-1232
Dieldrin	Aroclor-1242
Endrin	Aroclor-1248
4,4'-DDD	Aroclor-1254
Endosulfan II	Aroclor-1260
4,4'-DDT	

Inorganic Target Compounds

Aluminum	Manganese
Antimony	Mercury
Arsenic	Nickel
Barium	Potassium
Beryllium	Selenium
Cadmium	Silver
Calcium	Sodium
Chromium	Thallium
Cobalt	Vanadium
Copper	Zinc
Iron	Cyanide
Lead	Sulfide
Magnesium	Sulfate

SPECIAL PESTICIDE LIST

2,4-D

Atrazine

Metolachlor -- Dual

Cyanazine -- Bladex

Fonofos -- Dyfonate

EPTC -- Eptam, Eradicane

Phorate

Metribuzin -- Lexone, Sencor

Trifluralin -- Treflan

Diazinon

Alachlor -- Lasso

QUALIFIER DEFINITION ORGANICS

- P not used
- CV not used
- AV not used
- AS not used
- T not used
- NR The analyte was not required to be analyzed.
- R Rejected data. The QC parameters indicate that the data is not usable for any purpose.

DEFINITION INORGANICS

- Method qualifier indicates analysis by ICP (Inductively Coupled Plasma) Spectroscopy.
- Method qualifier indicates analysis by Cold Vapor AA.
- Method qualifier indicates analysis by Automated Cold Vapor AA
- Method qualifier indicates analysis by Semi-Automated Cold Spectrophotometry.
- Method qualifier indicates Titrimetric analysis.
- The analyte was not required to be analyzed.
- Rejected data. The QC parameters indicate that the data is not usable for any purpose.

U.S.E.P.A. DEFINED DATA QUALIFIERS

QUALIFIER DEFINITION ORGANICS

- U Compound was tested for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For soil samples subjected to GPC clean-up procedures, the CRQL is also multiplied by two, to account for the fact that only half of the extract is recovered.

- J Estimated value. Used when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed or when the mass spectral data indicate the presence of a compound that meets the identification criteria and the result is less than the sample quantitation limit but greater than zero. Used in data validation when the quality control data indicate that a value may not be accurate.

- C This flag applies to pesticide results where the identification is confirmed by GC/MS.

- B Analyte was found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action

- D Identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values are flagged with the "D" flag.

DEFINITION INORGANICS

- Analyte was analyzed for but not detected.
- Estimated value. Used in data validation when the quality control data indicate that a value may not be accurate.
- Method qualifier indicates analysis by the Manual Spectrophotometric method.
- The reported value is less than the CRDL but greater than the instrument detection limit (IDL).

not used

APPENDIX D
SITE PHOTOGRAPHS

Date: 12/5/95

Time: 12:15

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X207

Direction: north

Description: Furthest down stream sample point on Thorn Creek.



Date: 12/5/96

Time: 12:15

Photo Taken By: Mark Wagner

Site Name/ILD#:Alco Springs

ILD 048 300 412

Sample Location: X207

Direction: east

Description: Furthest down stream sample point on Thorn Creek.



Date: 12/5/95

Time: 12:30

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X206

Direction: north

Description: 270 feet down stream of
X204/X205



Date: 12/5/96

Time: 12:30

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X206

Direction: east

Description: 270 feet down stream of
X204/X205



Date: 12/5/95

Time: 12:45

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X204/X205

Direction: west

Description: 277 feet down stream of
X203



Date: 12/5/96

Time: 12:45

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X204/X205

Direction: north

Description: 277 feet down stream of
X203



Date: 12/5/95

Time: 3:00

Photo Taken By: Mark Wagner

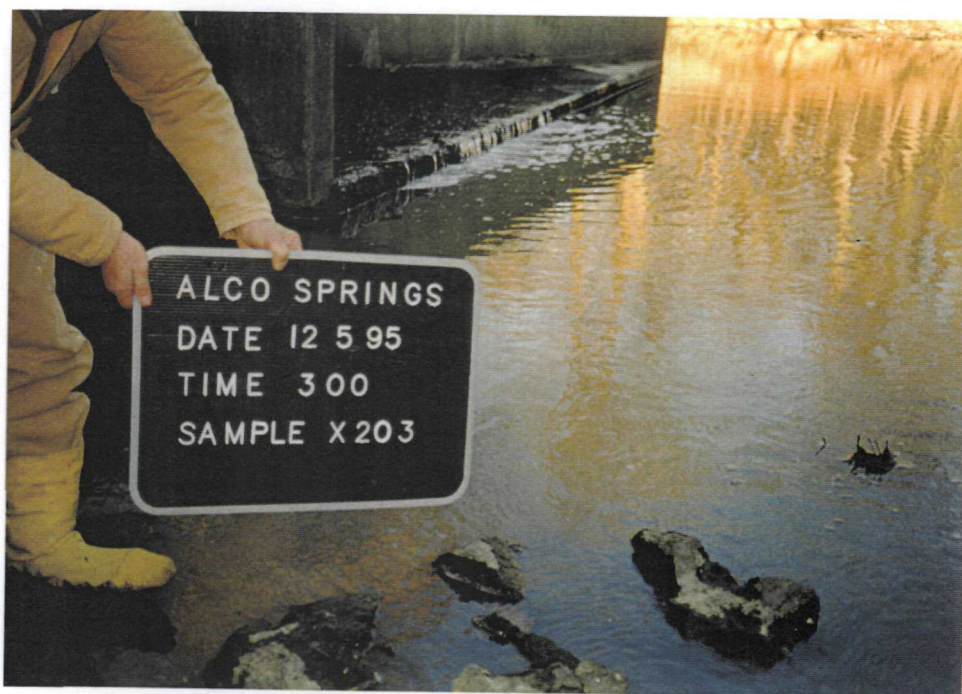
Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X203

Direction: south

Description: 177 feet down stream of
X202



Date: 12/5/96

Time: 3:00

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X203

Direction: east

Description: 177 feet down stream of
X202



Date: 12/5/95

Time: 3:30

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X202

Direction: east

Description: at PPE from site to
Thorn Creek.



Date: 12/5/96

Time: 3:30

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X202

Direction: south

Description: at PPE from site to
Thorn Creek.



Date: 12/5/95

Time: 3:35

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X208

Direction: east

Description: Storm water runoff from an unnamed creek east of the rail road bridge.



Date: 12/5/95

Time: 3:35

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X208

Direction: south

Description: Storm water runoff from an unnamed creek east of the rail road bridge.



Date: 12/5/95

Time: 3:50

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X201

Direction: east

Description: Background sample from NW corner of Sauk Trail Lake



Date: 12/5/95

Time: 3:50

Photo Taken By: Mark Wagner

Site Name/ILD#: Alco Springs

ILD 048 300 412

Sample Location: X201

Direction: north

Description: Background sample from NW corner of Sauk Trail Lake



APPENDIX E
1995 SIP Inspection, Sample Location Map
& Key Sample Summary

Table 3-1
Sample Descriptions
Alco Springs Industries

Sample	Depth	Appearance	Location
GW01	Unknown	Initial purge water red, later clears	Sauk Trail Forest Preserve pump well
GW02	75 - 79 feet	Clear, strong sulfur	Onsite production well
RW01	493 feet	Clear	South Chicago Heights municipal well located at 2729 Jackson Street
ST01	0 - 6 inches	Brown clayey sand	Eastern bank of Thorn Creek, 200 feet upstream of the site
ST02	0 - 6 inches	Brown sandy clay/silt, with decomposing organics	Eastern bank of Thorn Creek, 100 feet downstream of confluence of drainage culvert and Thorn Creek
ST03	0 - 6 inches	Dark brown, organic-rich soil, strong decomposition odor	Marsh area below the landfill
SS01	0 - 6 inches	Brown silty sand	West of Thorn Creek and south of railroad tracks
SS02	0 - 6 inches	Brown sandy silt	Exposed face of landfill
SS03	0 - 6 inches	Gray, brown sandy clay with leaves and gravel	Between drainage culvert and pathway

**Table 3-2
Key Sample Summary**

Groundwater (concentrations in $\mu\text{g/L}$)			
Substance	Sample Number		
	RW01 (Background)	GW01	GW02
Cobalt	6 U		22.0 B
Manganese	42	199	331
Nickel	20 U		22.9 B

Notes:

- U** Substance is undetected. The reported value is the contract required quantitation limit.
- B** Indicates that the reported value is less than the contract required detection limit, but greater than or equal to the instrument detection limit.

Table 3-2 (Continued)
Key Sample Summary

Soil (concentrations in $\mu\text{g/Kg}$)					
Substance	Sample Number				
	SS01 (Background)		SS02		SS03
Anthracene	410	U	1,000		
Benzo(a)anthracene	61	J	5,000 D	240	J
Benzo(b)fluoranthene	110	JX	6,400 DX	520	JX
Benzo(k)fluoranthene	110	JX	6,000 DX	470	JX
Benzo(g,h,i)perylene	410	U	2,400	1,000	J
Benzo(a)pyrene	54	J	4,000 D	250	J
Chrysene	78	J	4,000 D	320	J
Dibenzo(a,h)anthracene	410	U	590		
Fluoranthene	100	J	5,200 D		
Fluorene	410	U	590		
Indeno(1,2,3-cd)pyrene	410	U	2,400		
Phenanthrene	65	U	3,000 D	340	J
Pyrene	96	J	7,100 D	800	
Aldrin	0.38	J		8.1	JP
Heptachlor epoxide	2.1	U		2.3	JP
Endosulfan I	2.1	U		2.3	J
4,4'-DDE	2.8	JP		7.4	P
4,4'-DDD	1.8	JP		23	JP
4,4'-DDT	4.8	P		46	JD
Methoxychlor	21	U	21 P		
Alpha-chlordane	2.1	U		3.3	JP
Gamma-chlordane	2.1	U		6.1	J

Notes:

- J Reported value is estimated.
- P Greater than twenty-five percent difference for detected concentrations.
- U Substance is undetected. The reported value is the contract required quantitation limit.
- D This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- X Results could not be distinguished.

Table 3-2 (Continued) Key Sample Summary			
Soil (concentrations in $\mu\text{g/Kg}$)			
Substance	Sample Number		
	SS01 (Background)	SS02	SS03
Calcium	13,200,000	40,400,000	104,000,000
Chromium	10,800 B	183,000	79,400
Cobalt	6,400 JE	22,100	
Copper	12,800	38,500 JE	102,000 JE
Iron	9,860,000		53,100,000
Magnesium	7,710,000	42,200,000	71,700,000
Manganese	309,000	1,080,000	
Nickel	11,800	366,000	45,900

Notes:

- J Reported value is estimated.
- B Indicates that the reported value is less than the contract required detection limit, but greater than or equal to the instrument detection limit.
- E The reported value is estimated because of the presence of interference.

Table 3-2 (Continued) Key Sample Summary				
Sediment (concentrations in $\mu\text{g/Kg}$)				
Substance	Sample Number			
	ST01 (Background)	ST02	ST03	
Anthracene	450 U	510 J		
Benzo(a)anthracene	89 J	2,500 J		
Benzo(b)fluoranthene	91 J	2,100 J		
Benzo(k)fluoranthene	120 J	2,000 J		
Benzo(g,h,i)perylene	450 U	1,700 J		
Benzo(a)pyrene	93 J	2,400 J		
Chrysene	100 J	2,900 J		
Fluoranthene	270 J	1,600		
Indeno(1,2,3-cd)pyrene	450 U	1,600 J		
Phenanthrene	150 J	1,200		
Pyrene	220 J	4,600 J		
4,4'-DDD	5.1 P	30 P		
Endosulfan sulfate	4.4 U	7.2 P		
Methoxychlor	23 U	40 P		
Endrin ketone	4.4 U	25 P		
Alpha-chlordane	1.3 JP	4.7 P		
Aroclor-1254	44 U	170		
Antimony	1,300 U	1,900 B		
Arsenic	4,800 J	17,400		
Calcium	12,000,000	76,100,000	49,300,000	
Copper	21,900	303,000		
Lead	23,000	77,600		
Manganese	155,000	487,000		
Zinc	57,500	201,000		

Notes:

- J Reported value is estimated.
- U Substance is undetected. The reported value is the contract required quantitation limit.
- P Greater than twenty-five percent difference for detected concentrations.
- B Indicates that the reported value is less than the contract required detection limit, but greater than the instrument detection limit.

